

What is claimed is:

1. A power conversion device, comprising:
 - a multilevel converter configurable to convert an input waveform having a first frequency into a second waveform having a second frequency, wherein the second frequency is higher than the first frequency;
 - a transformer coupled to the multilevel converter and configurable to transform the second waveform from a first voltage level to a second voltage level, wherein the first voltage level is higher than the second voltage level; and
 - a switched inverter circuit coupled to the transformer and configurable to convert the transformed, second waveform into a third waveform for use with a power application.
2. The device of claim 1, further comprising:
 - a filter circuit coupled to the switched inverter circuit for smoothing the third waveform into a substantially clean, sinusoidal waveform.
3. The device of claim 1, wherein the multilevel converter is a diode-clamped multilevel converter.
4. The device of claim 1, wherein the multilevel converter further comprises:
 - a first set of switches configurable to provide a multilevel, full-bridge converter; and
 - a second set of switches coupled to the first set of switches and configurable to provide a multilevel, full-bridge inverter.
5. The device of claim 4, wherein the second set of switches are configurable to provide a multilevel, half-bridge inverter.
6. The device of claim 4, wherein the first set of switches is coupled to the second set of switches by a Direct Current (DC) link.
7. The device of claim 6, wherein the DC link includes two or more DC voltage storage devices.
8. The device of claim 1, wherein the switched inverter circuit further comprises:
 - a diode bridge for rectifying the second waveform into at least one Direct Current (DC) voltage level;

a DC storage device coupled to the diode bridge for maintaining the DC voltage level;
and

a set of switches configurable for synthesizing the DC voltage level into the third waveform.

9. The device of claim 1, wherein the multilevel converter is configurable to convert three-phase input waveforms.

10. The device of claim 1, wherein the multilevel converter includes a plurality of high-voltage Integrated Gate Bipolar Transistors (IGBTs) for directly coupling the multilevel converter to a distribution voltage level.

11. The device of claim 1, wherein the multilevel converter includes a Direct Current (DC) bus comprising multiple storage devices.

12. The device of claim 11, wherein the DC bus is adapted to be coupled to a DC/DC converter circuit for providing one or more DC output voltage levels.

13. The device of claim 11, wherein the DC bus is adapted to be coupled to one or more additional switched inverter circuits for providing a variable frequency output.

14. A method of converting power, comprising:

converting an input waveform having a first frequency into a second waveform having a second frequency, wherein the second frequency is higher than the first frequency;
transforming the second waveform from a first voltage level to a second voltage level, wherein the first voltage level is higher than the second voltage level; and
converting the transformed, second waveform into a third waveform for use with a power application.

15. The method of claim 14, further comprising:

smoothing the third waveform into a substantially clean, sinusoidal waveform.

16. The method of claim 14, wherein the step of converting the transformer, second waveform into a third waveform further comprises:

rectifying the second waveform into at least one Direct Current (DC) voltage level;
maintaining the DC voltage level; and

synthesizing the DC voltage level into the third waveform.